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09/756,772	01/10/2001	Jong In Song	EM/SONG/6404	6482

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EXAMINER

TAKAOKA, DEAN O

ART UNIT

PAPER NUMBER

2817

DATE MAILED: 06/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/756,772

Applicant(s)

LEE ET AL.

Examiner

Dean O Takaoka

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4 is/are rejected.
- 7) ☒ Claim(s) 5 and 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 26 March 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 4 is rejected under 35 U.S.C. 102(b) as being anticipated by Beyer et al (U.S. Patent No. 5,046,155) for reasons of record contained in the previous office action dated May 17, 2002.

Claim 4:

Claim 4 has been amended to include the limitation where the input and output transmission lines with respect to the drain and gate lines have been reversed. The prior art of Beyer et al. (Fig. 8) still meets these limitations.

Additional changes made to claim 4 for “improving gain flatness and maximizing bandwidth of the amplifier relative to an amplifier in which phase velocities are unmatched” is inherently met by Beyer et al. since the structure of Beyer et al. is identical as claimed to that of the current invention.

For example, Beyer et al. teaches unmatched phases of the prior art (Beyer et al. – Fig. 1) where the embodiments of Beyer et al. improve directivity thru the identical structure such as shown in Fig. 8. Although Beyer et al. uses the term minimization bandwidth, Beyer et al. teaches broadening bandwidth by minimization of S₃₁ parameters (e.g. minimization bandwidth – col. 4, lines 35-44) by binomial scaling the

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effective transconductances resulting in increasing the directivity (col. 2, lines 17-24) further supporting the inherency for meeting the newly added limitations.

Claims 5 and 6 have not been amended, thus the rejection of record is maintained.

Response to Arguments

Applicant's arguments filed November 19, 2002 (paper no. 8) have been fully considered but they are not persuasive.

3A. Claim 4:

With respect to phase velocity matching, it is argued that the "T-section of Beyer is used for an entirely different purpose and does not provide phase velocity matching". The Examiner refers to the disclosure of the current application (page 5, lines 2-7) where Fig. 1 is disclosed as prior art where the "impedance and velocity matching conditions cannot be achieved and improvement in gain-bandwidth product of the simple traveling-wave amplifier structure shown in Fig. 1 is limited".

Fig. 1 (prior art) of the disclosure is substantially identical to the prior art shown by Beyer et al. (also Fig. 1) where Beyer et al. shows a symmetrical prior art distributed amplifier where currents traveling in the forward direction are "in phase" while those traveling in the reverse direction are "out of phase" and "destructively interfere to some extent" (col. 1, lines 53-63). Beyer et al. further teaches where "the minimization of S_{31} is inherently centered at a frequency $\omega = \omega_0$ at which the phase shift per x-section is $\beta = \beta_0 = 90^\circ$ ", thus the angular velocity ω being "in phase" (col. 4, lines 35 – 38). The passive T-sections of Beyer et al. are shown in Fig. 6 where the insertion of the T-

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sections minimizes the bandwidth, with respect to Fig. 8. While Beyer et al. does not explicitly recite "phase velocity", Beyer et al. shows the proportion of gain to capacitance of the capacitors by the equation for transconductance g_{mi} (col. 4, lines 10-15) achieved thru binominal scaling (col. 4, lines 5-21) to achieve the desired gain " g_{mi} ", thus increasing directivity (col. 4, lines 23-34).

It is argued that "phase shifting" and "phase velocity" are distinct concepts. The Examiner asserts that while the concepts may be defined by the Applicant as distinct, they are interrelated in that "phase shift" is a well-known as a directional component (The Art of Electronics, second edition, page 79, figure 2.30) which illustrates a phase diagram with angle theta θ while the components of "phase velocity" are directional as well as having a magnitude. Beyer et al. teaches increasing directivity (discussed above) thus inherently increasing the "phase velocity". Fig. 4 of Beyer et al. further illustrates the improved directivity (col. 4, lines 29-34). The m-derived terminations of Beyer et al. (Figs. 1 and 3) are to illustrate the prior art as well illustrating the use of capacitors connected to the gate of the amplifier in an embodiment of Beyer et al. to illustrate the voltage divider circuit arrangement with respect to the transconductance g_{mi} of an nth circuit arrangement. With transconductance further defined as the ratio of " I_{out}/V_{in} " (The Art of Electronics, second edition, page 79 1st paragraph), further illustrating the teaching of Beyer et al. inherently teaching with respect to "phase velocity".

With respect to Figs. 3 and 4, it is argued that the binomial scaling of Beyer et al. increases the bandwidth (col.2, lines 17-22), which is clearly taught by Beyer et al.,

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however is also argued that "the gain is decreased by binomial scaling, the bandwidth must be increased by a corresponding amount", amendment page 5, lines 17 and 18. It does not appear that any decrease of gain due to bandwidth broadening is taught by Beyer et al. and the Examiner invites the Applicant to point out where this would be either taught explicitly or implicitly by Beyer et al.

It is asserted by the Examiner that Beyer et al. inherently achieves the same solution as that claimed by current invention in that the structure of Beyer et al. (Fig. 8) is identical, as claimed, to that of the current invention and thus inherently achieves the same characteristics of the limitations contained in the claims. The Examiner refers to MPEP 2112 where "*The claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable.*" and MPEP 2112.01 where the structure of Beyer et al. is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent.

B and C. Claims 5 and 6:

With respect to Exhibit I – Figs. A-C submitted by the Applicant, with figure C a representation of the current invention redrawn as a comparison to Beyer et al., further illustrates the identical structure, as claimed between Beyer et al. and the current application.

The Examiner agrees that Fig. B represents Fig. 8 of Beyer et al. while Fig. C represents the current invention. It can be seen by Fig. B (Beyer et al.) that the two adjacent transmission lines $L_d/2$ and $L_g/2$, connected to the drain and gate respectively and between capacitors $C_{ds}/2$ or $C_{gs}/2$, can be represented as one transmission line

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Ld. Similarly, the two adjacent capacitors $C_{ds}/2$ or $C_{gs}/2$, between transmission lines $L_{d/2}$ or $L_{g/2}$ can also be represented as one capacitor C_{ds} for the drain connected capacitor and C_{gs} for the gate connected capacitor (col.4, lines 58-65). Thus, the transmission lines of Beyer et al. being substantially identical to that of the current invention. While the value of the transmission line of the drain and gate of Beyer et al. are $2L_d$ and 2π , or simplified L_d and π , with the total drain line length L_d of Beyer et al., equivalent to the total drain line length L_d of the Applicant's drain line, it could not be said that the first and second length of transmission line of Beyer et al. ($L_d/2$ and $L_d/2$) is equivalent to the lengths of transmission line shown by the Applicant where the second length of transmission line $(1-x)L_d$, further where $0 < x < 1$.

Allowable Subject Matter

Claims 5 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

All previous claim objection and claim rejections under 35 USC 112 second paragraph have been withdrawn in view of Applicant's amendment dated November 19, 2002 (paper no. 8).

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Art of Electronics, second edition – discusses transconductance.

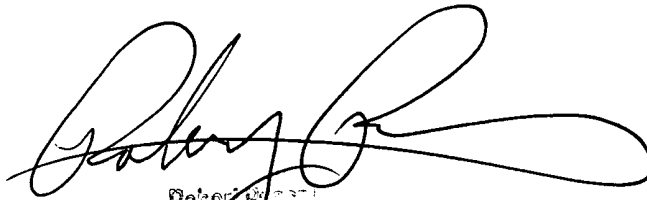
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dean O Takaoka whose telephone number is (703) 305-6242. The examiner can normally be reached on 8:30a - 5:00p Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (703) 308-4909. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

dot
May 30, 2003



Robert Pascal
Supervisor
Telephone: (703) 308-4909